

tBOX520

Fanless Embedded System with 12th Gen Intel® Core™ i7/i5/i3 Processor for Railway



Features

- CE, LVD, FCC, EN 50155, and EN 45545-2 certified
- 12th Gen Intel® Core™ i7/i5/i3 or Celeron® processor (Alder Lake P)
- 24 to 110 VDC for railway applications
- Value-added modules available for various I/O requirements (COM/LAN/DIO/PoE/CAN/BNC)
- Intelligent solution of power management (smart ignition)
- 2 swappable 2.5" SATA drives

Specifications

Standard Color	Silver		
Construction	Aluminum extrusion and heavy-duty steel, IP30		
CPU	12th Gen Intel® Core™ i7/i5/i3 or Celeron® processor (13th Gen by request)		
Chipset	SoC integrated		
System Memory	2 x DDR5-4800 SO-DIMM, up to 64GB		
BIOS	AMI		
TPM	TPM 2.0		
System I/O Outlets	Serial	1 x DB9 serial console or RS-232/422/485	
	Display	2 x Type A HDMI 1.4b (4K)	
	Audio	1 x Mic-in & 1 x Line-out	
	Ethernet	1 x RJ-45 2.5GbE LAN (Intel® I226-IT)	
	USB	4 x USB 3.0	
	Others	1 x reset button	
		8 x antenna opening	
	1 x power button		



Specifications

Expansion Interface	1 x M.2 Key M 2280 NVMe SSD (PCIe x4) 1 x M.2 Key B 3052/3042 for 5G/LTE (4G) (PCIe/USB) 1 x full-size Rev. 1.2 PCIe Mini Card slot for LTE/Wi-Fi/Bluetooth/GPS (PCIe/USB) 2 x Nano SIM slot 1 x M.2 Key A or E for Wi-Fi 6/Bluetooth (PCIe/USB)
Storage	SATA drive 2 x swappable 2.5" SATA drive (9.5 mm height), Intel® RAID 0/1 supported
Watchdog Timer	255 levels, 1 to 255 sec.
Power	Power Supply Railway: 1 x M12, 24 to 110 VDC
PoE (PSE, Power Sourcing Equipment)	PoE Performance The tBOX520 PoE SKUs equipped with VAM701/703/705/707 can support up to 8 configurable M12/RJ-45 PoE ports <ul style="list-style-type: none"> • PoE (802.3af 15.4W per port) • PoE+ (802.3at 30W per port)
System Indicator	1 x LED indicator for power 1 x LED indicator for SATA drive activity 2 x Programmable
Operating Temperature	-40°C to +70°C (-40°F to +158°F) with W.T. peripheral*
Relative Humidity	0% to 95% relative humidity, non-condensing
Dimensions (W x D x H)	321 x 210.2 x 73.3 mm (12.64" x 8.28" x 2.89") (without wall mount)
Mounting	Wall mount
Weight (net/gross)	3.9 kg (8.6 lb)/ 6 kg (13.2 lb)
Certifications	CE (Class A), LVD, FCC (Class A), EN 50155, and EN 45545-2
EMC	CE/FCC EN 61000-6-4 (Class A), EN 61000-6-2, and FCC part 15 B (Class A) EN 50155 EN 50121-3-2, IEC 62236-3-2
LVD	EN 60950-1
Vibration Endurance	3 Grms with SSD (5 to 500Hz, X/Y/Z direction; random, operating) 1 Grms with HDD (5 to 500Hz, X/Y/Z direction; random, operating) MIL-STD-810G, Method 514.6C-VI Category 4 compliant EN 50155 EN 61373 category 1 class B
Shock	EN 50155 EN (IEC) 61373 category 1 class B, half-sine pulse, 5g, 30ms (longitudinal direction), 3g, 30ms (vertical/transverse direction)
EOS Support	Ubuntu 22.04, Windows® 10, and Windows® 11
Software Support	Axiomtek EAPI

*Wide Temperature. All W.T. supported products have to be sorted by Axiomtek.

Ordering Information

Non-PoE SKU

tBOX520-ADL7-MR (P/N: E26N520100)	Fanless railway embedded system with Intel® Core™ i7-1265UE processor, 4 USB 3.0, 2 HDMI, LAN, serial console or RS-232/422/485, Mic-in/Line-out, two 2.5" SATA trays, M12 A-code DC-in, and 24 to 110 VDC
tBOX520-ADL5-MR (P/N: E26N520101)	Fanless railway embedded system with Intel® Core™ i5-1245UE processor, 4 USB 3.0, 2 HDMI, LAN, serial console or RS-232/422/485, Mic-in/Line-out, two 2.5" SATA trays, M12 A-code DC-in, and 24 to 110 VDC
tBOX520-ADL3-MR (P/N: E26N520102)	Fanless railway embedded system with Intel® Core™ i3-1215UE processor, 4 USB 3.0, 2 HDMI, LAN, serial console or RS-232/422/485, Mic-in/Line-out, two 2.5" SATA trays, M12 A-code DC-in, and 24 to 110 VDC
tBOX520-ADLC-MR (P/N: E26N520103)	Fanless railway embedded system with Intel® Celeron® 7305E processor, 4 USB 3.0, 2 HDMI, LAN, serial console or RS-232/422/485, Mic-in/Line-out, two 2.5" SATA trays, M12 A-code DC-in, and 24 to 110 VDC

PoE SKU

tBOX520-ADL7P-MR (P/N: E26N520105)	Fanless railway embedded system with Intel® Core™ i7-1265UE processor, 4 USB 3.0, 2 HDMI, LAN, serial console or RS-232/422/485, Mic-in/Line-out, two 2.5" SATA trays, M12 A-code DC-in, 24 to 110 VDC, and PSE (supporting PoE LAN ports with VAM701/703/705/707)
tBOX520-ADL5P-MR (P/N: E26N520106)	Fanless railway embedded system with Intel® Core™ i5-1245UE processor, 4 USB 3.0, 2 HDMI, LAN, serial console or RS-232/422/485, Mic-in/Line-out, two 2.5" SATA trays, M12 A-code DC-in, 24 to 110 VDC, and PSE (supporting PoE LAN ports with VAM701/703/705/707)

Ordering Information

Value-Added Modules (VAMs)

VAM100 (P/N: E277100100)	4 x terminal block 4-wire isolated RS-232/422/485 COM Isolation voltage: 2 kV	
VAM102 (P/N: E277102100)	4 x terminal block isolated CAN bus 2.0A/B (SocketCAN available) Isolation voltage: 2 kV	
VAM200 (P/N: E277200100)	1 x terminal block isolated DIO 8-in/8-out Isolation voltage: 2 kV	
VAM400 (P/N: E277400100)	4 x BNC video-in & 1 x BNC audio-in • Supports FPS: NTSC/PAL (up to 120fps @ 960/720 x 480 / 100fps @ 960/720 x 576), H.264 video recording 2 x full-size Rev. 1.2 PCIe Mini Card slot • 1 x USB with SIM socket • 1 x USB/PCIe with SIM socket (occupied by 1 x capture card)	
VAM600 (P/N: E277600100)	2 x full-size Rev. 1.2 PCIe Mini Card slot • 1 x USB/PCIe with SIM socket • 1 x USB with SIM socket 4 x antenna opening	
VAM700/VAM701 (P/N: E277700100/E277701100) VAM702/VAM703 (P/N: E277702100/E277703100) VAM704/VAM705 (P/N: E277704100/E277705100) VAM706/VAM707 (P/N: E277706100/E277707100) VAM708 (P/N: E277708101)	VAM700/701 (PoE): 4 x M12 A-code GbE (PoE optional*) VAM702/703 (PoE): 4 x RJ-45 GbE (PoE optional*) VAM704/705 (PoE): 4 x M12 D-code 10/100 Mbps Ethernet (PoE optional*) VAM706/707 (PoE): 4 x M12 X-code GbE (PoE optional*) VAM708: 4 x M12 A-code with LAN bypass * VAM701/703/705/707 must be installed in tBOX520 PoE SKUs to support PoE LAN ports.	
VAM900 (P/N: E277900100)	2 x full-size Rev. 1.2 PCIe Mini Card slot • 2 x USB with SIM socket 1 x half-size Rev. 1.2 PCIe Mini Card slot • 1 x PCIe 1 x terminal block 4-wire isolated RS-232/422/485 COM (isolation voltage: 2 kV) 1 x terminal block isolated CAN bus 2.0A/B (isolation voltage: 2 kV) 1 x terminal block isolated DIO 8-in/8-out (isolation voltage: 1.5 kV)	

For more details on individual VAM modules, please refer to the 'Value-added Module' section on Axiomtek's website.

Optional

Communication Modules	E29R300103 E29R301103 E29R326100 E29R321103 E29R316109 E39P118109 E39P118119	ACC300-001-203 ACC301-701-203 ACC326-700-203 ACC321-B00-40J ACC316-501-203 EIO118-EAU-001 203 EIO118-EAU-001 304	Wi-Fi 5 QCNFA324 mPCIe card kit Wi-Fi 5 QCNFA364A M.2 2230 kit Wi-Fi 6 AX210 M.2 2230 kit 5G RM520N-GL kit 4G EG25-G mPCIe card kit LTE EIO118-EAU kit LTE EIO118-EAU with GPS kit	
AC to DC Adapter	509000002200	PWS 9NA0908344 FSP 90W AC to DC (24V) adapter with M12 connector * For adapter used with tBOX520 PoE SKUs, please contact the sales team for more information.		
Cable/Power Cord	594B8120B30E 59412042700E 594N3202730E 594B8152710E 599000001100 59906000010E 59903000000E 59904010000E	DC-in cable M12 female 5P 180 cm without ACC LAN cable M12 D-code 4P to RJ-45 8P L=180 cm LAN cable M12 A code male 8P to RJ-45 LAN cable M12 X-code to RJ-45 plug CAT6 180 cm Power cord YP12/YC12_CY-U0032 YUNG_LI 1830 mm Power cord YP-12/YC-12 (Japan) Power cord YP-22/YC-12 (Europe) Power cord YP-61A/YC-12 (UK) L=1830 mm		
Anti-vibration Kit	8816N5008A0E	For in-vehicle/rolling stock which improves HDD stability in NVR applications *For more information, please search for "Anti-vibration kit" on the Axiomtek website.		

*Specifications and certifications may vary based on different requirements.

Packing List

Thermal pads for memory and NVMe
 4 x foot pad
 4 x mylar for HDD or SSD
 1 x wall mount kit
 2 x keys for HDD/SSD tray lock
 2 x HDMI bracket
 1 x audio bracket

Power Protection

OCP (over current protection)
 OVP (over voltage protection)
 UVP (under voltage protection)
 RPP (reverse polarity protection)

Dimensions

